Original Article

Pattern of Respiratory Diseases among Patients Seen at the Emergency Unit of a Tertiary Health Facility in South-West Nigeria

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ABSTRACT

Background: Respiratory diseases constitute a large percentage of the medical conditions requiring hospital presentation. The burden of respiratory diseases presenting as emergencies need to be understood.
Objective: This study aimed at reviewing the pattern of respiratory diseases in the emergency unit of Federal Medical Centre, Owo.
Methods: The records of 914 patients seen with respiratory diseases from January 2007 to December 2012 were reviewed. Data were analyzed using SPSS version 21. Descriptive statistics were done. Chi-square test was used to compare other sociodemographic characteristics and disease-related variables by gender. Level of statistical significant was 5%.
Results: The mean age of respondents was 46.5 ± 20 years, 54.9% were 40 years and above. Males were 57.9%, 24% presented as acute conditions, 10.4% were Human immunodeficiency virus, HIV-positive. Death occurred in 7.1% within 24 h of admission. Median length of stay was 1.9 ± 1.4 days. Complicated pulmonary tuberculosis (PTB) was diagnosed in 35.1% of the patients followed by pneumonias (26.9%) and acute severe asthma (18.4%). The mean age of male patient was 48.5 ± 20.4 years while female was 43.8 ± 18.9 years, males are significantly older than females $P < 0.001$. Patients with HIV were younger with mean age 35.9 ± 10.4 years compared with HIV-negative patients, 47.8 ± 20.3 years $P < 0.001$. More females (13.8%) were HIV-positive compared to males (7.9%), $P = 0.004$.
Conclusion: Complicated PTB and the pneumonias were the leading causes of respiratory emergency in our environment. Not all respiratory cases seen at the emergency were acute condition. Standard precaution should be ensured as every one out of ten patients seen were HIV-positive. Disparities exist in the pattern of respiratory disease across gender.

Key words: Emergencies, HIV, pneumonia, respiratory diseases, tuberculosis

INTRODUCTION

Respiratory diseases constitute a large percentage of the medical conditions seen at the emergency department.[1] The common causes of respiratory emergencies include pneumonias, acute severe asthma, acute exacerbation of chronic obstructive pulmonary diseases (COPD), TB, lung cancers, and acute respiratory distress syndromes from other causes.[2] In Nigeria, as in many African countries, communicable diseases continue to take their toll on the populace, however, with increasing smoking prevalence, rapid urbanization with its attending air pollution and exposure to biomass fuels from various sources, the noncommunicable respiratory diseases are gradually adding to the disease burden in this region.[3]

Globally, the burden of respiratory emergencies also continues to rise. In Sub-Saharan Africa with over-stretched health facilities, the challenge is equally great. It is projected that respiratory conditions such as COPD will constitute one of the highest causes of mortality in the nearest future.[4] Asthma is projected to increase from 300 to 400 million by the year 2025.[5]

Most of the patients in Africa tend to present first at the emergency department[6] hence there is the need to adequately

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equip the existing facilities in preparation for the expected rise in morbidity and mortality from these conditions.

Few studies[7,8] have taken a look at the pattern of respiratory emergencies in Nigeria. However, in view of the changing epidemiology of diseases and rapid urbanization, there is the need to study the current state of presentation in the emergency department. Hence, we set out to analyze the pattern of respiratory emergencies in our hospital with a view to documenting the top causes of emergency respiratory presentations and to identify possible reasons for the observed pattern.

MATERIALS AND METHODS

A review of the records of 914 patients seen with respiratory diseases (which include disorders that affect the respiratory system and included airway diseases such as Asthma, COPD, infectious diseases such as pneumonia, tuberculosis, and tumors affecting the lungs such as lung cancers etc.,) from January 2007 to December 2012 at the emergency unit of the Federal Medical Centre, Owo was done. A structured pro formal was used to extract the following variables age, sex, presentation, HIV status, outcome of care, whether or not the patient was discharged against medical advice, admission status, time patient was seen, and diagnosis from the hospital records. Data were analyzed using IBM SPSS Statistics for Windows, Version 21.0. Descriptive statistics were presented using frequency tables and bar chart, age and length of stay (LOS) were summarized as mean and standard deviation. Chi-square test was used to compare the following variables age group, HIV status, presentation, outcome of care, admission status, and diagnosis with gender and diagnosis with period patients were seen. Level of statistical significance was set at $P = 0.05$.

Ethical approval
This was obtained from the Ethical Committee of the Federal Medical Centre, Owo. Reference FMC/OW/380/VOL.XX/61.

RESULTS

Respiratory diseases were reported by 914 patients of the 16815 patients seen at the emergency unit of the hospital from January 2007 to December 2012.

Table I shows the characteristics of the patients seen at the emergency unit of FMC, Owo January 2007–December 2012. The mean age of respondents was 46.5 ± 20 years. In all, 502 (54.9%) were 40 years and above. Males were 529 (57.9%) while females were 385 (42.1%). Only 219 (24%) presented as acute conditions, 95 (10.4%) were HIV-positive. Death occurred in 65 (7.1%) within 24 h of stay in the emergency. More patients, 539 (59%), were seen during the raining season.

Age of the patients in smaller groups is shown in Figure 1. Age group 30–39 years had 194 (21.2%) patients. The group with the minimum number of patient was age <20 with 48 (5%) patients. The mean age of male patients was 48.5 ± 20.4 years while for female was 43.8 ± 18.9 years. The difference in age is statistically significant $P < 0.001$.

Table I: Characteristics of patients seen at the emergency unit of FMC Owo, 2007-2012

Characteristics	Frequency	%
Age group in years		
<40	412	45.1
40 and above	502	54.9
Sex		
Male	529	57.9
Female	385	42.1
Presents as acute condition		
Yes	219	24
No	695	76
HIV Status		
Positive	95	10.4
Negative	819	89.6
Outcome		
DAMA	85	9.3
Died	65	7.1
Discharged	764	83.6
Admitted		
Yes	386	42.2
No	528	657.3
Season seen		
April-October	539	59.0
November-March	375	41
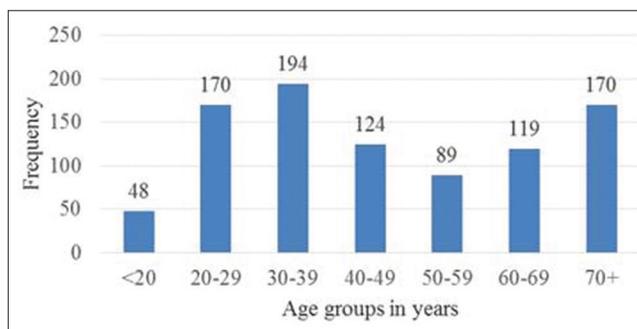
Figure 1: Age groups of the patients in years.

Table II shows the diagnosis, mean age and standard deviation of the patients. Complicated pulmonary tuberculosis (PTB) was diagnosed in 321 (35.1%) of the patients followed by pneumonias 246 (26.9%) and acute severe asthma 168 (18.4%). Only a few patients 10 (1.1%) had lung cancer. Patients with acute exacerbation of COPD had a mean age of 70.3 ± 12.1 years while PTB and acute severe asthma patients were 42.5 ± 16.5 years and 39.6 ± 17.8 years respectively $P < 0.001$. Patients with HIV were younger with a mean age of 35.9 ± 10.4 years compared to HIV-negative patients with 47.8 ± 20.3 years $P < 0.001$.

Pattern of presentation according to month of the year is shown in Figure 2. The highest number was seen in January 100 (10.9%) while the minimum showed up in December 58(6.3%). Other months were as shown in the figure.

Figure 3 shows the number of patients with chest diseases seen at the emergency unit of FMC, Owo during the study period.

190 (20.8%) were seen in 2008 while the minimum number of patients 113 (12.4%) were seen in 2012. Other years were as shown in the figure.

As shown in Table III patients with acute severe asthma had the minimum number LOS 1.53 ± 0.96 days while PTB patients had mean LOS of 2.15 ± 1.53 days. Although differences were observed in the LOS in the emergency department, the differences observed were not statistically significant, $P = 0.106$. Mortality within the first 24 h was 7.1% [Figure 4].

The characteristics of respondents by gender are as shown in Table IV. Among male respondents, 316 (59.7%) were 40 years and above while less than half 186 (48.3%) of female patients were in the same age category, males are significantly older than females $P = 0.01$. As regards HIV status, 53 (13.8%) female were positive compared to 42 (7.9%) males. The higher number of females being HIV-positive was statistically significant, $P = 0.004$. More female 78 (20.3%) presented with acute severe asthma compared to 90 (17.0%) male. Acute exacerbation of COPD was the cause of presentation in 66 (12.9%) males compared to 14 (3.6%) females, this difference is statistically significant $P = 0.01$.

As shown in Table V more patients were seen from April to October. In all 56 (68.3%) of patients with acute exacerbation of COPD were seen from April to October. The differences observed in the period patients were seen were not statistically significant.

DISCUSSION

Our findings revealed that respiratory diseases accounted for approximately 5.4% of presentations at the emergency unit with 24% of them presenting in acute conditions. This is comparable to the findings in Italy and Brazil 5.0% and 5.9%,

Figure 2: Month patients were seen at the emergency unit.

Figure 3: The year patients were seen.

Table II: Diagnosis and the mean age of patients

Diagnosis	N	%	Mean Age	Std. Deviation	Test Statistic	P-value
Acute Asthmatic Attack	168	18.4	39.6	17.9	F Test	<0.001
COPD	82	9.0	70.3	12.1	35.914	
PTB	321	35.1	42.5	16.5		
Pneumonia	246	26.9	46.2	21.0		
Pulmonary oedema	63	6.9	58.1	18.1		
Pleural Effusion	24	2.6	45.3	17.8		
*Others	10	1.1	36.9	17.7		
HIV Status						
Positive	95	10.4	35.9	10.4	t=−5.601	<0.001
Negative	819	89.6	47.8	20.3		

*Others: Lung Cancer (2), Breast Cancer with pulmonary metastasis (1)

Table III: Diagnosis and median length of stay (LOS) of patients with chest diseases seen at the emergency of FMC, Owo 2007-2012
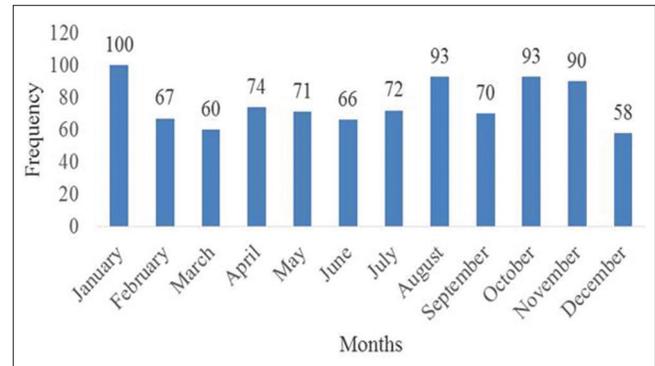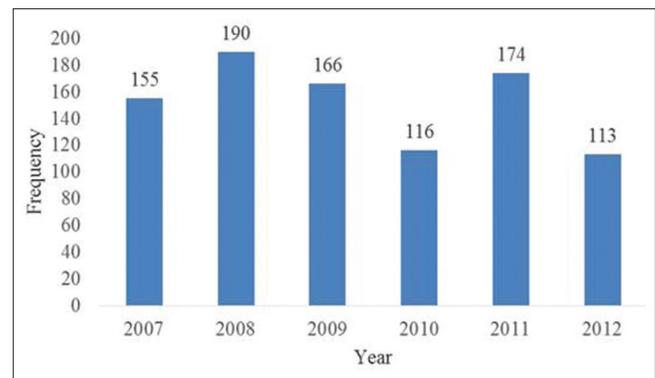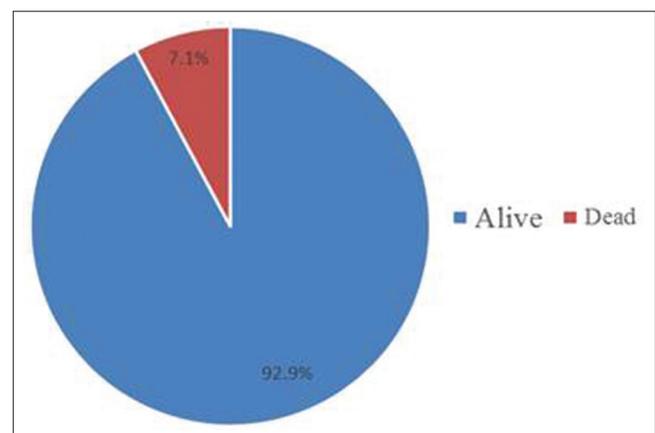
Diagnosis	N	Median LOS	Std. Deviation	F	P-value
Acute Asthmatic Attack	66	1.53	0.96	1.764	0.106
COPD	35	2.06	1.35		
PTB	118	2.15	1.53		
Pneumonia	99	1.99	1.37		
Pulmonary oedema	22	1.64	1.09		
Pleural Effusion	11	2.00	1.48		
*Others	4	2.00	0.82		

*Others: Lung Cancer (2), Breast Cancer with pulmonary metastasis

Figure 4: Mortality among patients seen during the study period.

Table IV: Respondents characteristics by gender

Characteristics	Male	Female	Chi-Square	P-value
Age group in Years				
<40	213 (40.3)	199 (51.7)	11.746	0.01
40 and above	316 (59.7)	186 (48.3)		
HIV status				
Positive	42 (7.9%)	53 (13.8%)	8.123	0.004
Negative	487 (92.1%)	332 (86.2%)		
Presents as acute condition				
Yes	119 (22.5%)	100 (26.0%)	1.48	0.224
No	410 (77.5%)	285 (74.0%)		
Outcome				
DAMA	51 (9.6%)	34 (8.8%)	0.608	0.738
Died	40 (7.6%)	25 (6.5%)		
Discharged	348 (82.8%)	326 (84.7%)		
Admitted				
Yes	219 (41.4%)	167 (43.4%)	0.357	0.550
No	310 (58.6%)	218 (56.6%)		
Diagnosis				
Acute Asthmatic Attack	90 (17.0%)	78 (20.3%)	24.383	<0.001
COPD	68 (12.9%)	14 (3.6%)		
PTB	179 (33.8%)	142 (36.9%)		
Pneumonia	140 (26.5%)	106 (27.5%)		
Pulmonary Oedema	32 (6.0%)	31 (8.1%)		
Pleural Effusion	14 (2.6%)	10 (2.6%)		
*Others	6 (1.1%)	4 (1.0%)		

*Others: Lung Cancer, Breast Cancer with pulmonary metastasis

Table V: Association between diagnosis and period patients were seen

Diagnosis	Period patients were seen		Chi-square	P value
	April - October N(%)	November - March N(%)		
Acute Asthmatic Attack	113 (67.3)	55 (32.7)	12.546	0.051
COPD	56 (68.3)	26 (31.7)		
PTB	179 (55.8)	142 (44.2)		
Pneumonia	132 (53.7)	114 (46.3)		
Pulmonary oedema	37 (58.7)	26 (41.3)		
Pleural Effusion	16 (66.7)	8 (33.3)		
*Others	6 (60.0)	4 (40.0)		

*Others: Lung Cancer , Breast Cancer with pulmonary metastasis

respectively.[9,10] This is, however, lower than 9.3% seen in Uyo and 9.8% in the USA and the 10.8% by Desalu *et al*., in Ido.[7,8,11]

Furthermore, our study found that complicated PTB was the most common respiratory condition necessitating presentation to the emergency unit with 35.1%, followed by pneumonias, 26.9%, acute severe asthma with 18.4%, and then COPD with 9.0%. Some of the observed complications of TB include respiratory failure, superimposed bacterial infection and sepsis.

This pattern is similar to the findings by Umoh *et al*., in Uyo which showed that PTB (66.8%) and pneumonia (24.9%)

were the two leading causes of presentations for admission.[7] However, in Ido-Ekiti, which is in the same geographic region as our hospital Desalu *et al*. reported a slightly different order with pneumonia coming ahead of PTB (34.5% vs. 29.4%), followed by acute asthma (24.5%), and acute exacerbation of COPD (10.3%).[8] Although the Ido-Ekiti study documented pneumonia as the commonest respiratory emergency, it is possible that some of the tuberculosis presented with superimposed bacterial infection.

The findings in this present study were different from the ones found in the UK and in Brazil where chronic noncommunicable respiratory diseases[12] and upper respiratory tract infections (URTIs) were the most common respiratory diseases seen in the emergency unit respectively.[10] The higher prevalence of smoking may account for the former. More than half of all the deaths from lung disease in Europe, and, at least, one-quarter of all respiratory hospital admissions are due to diseases caused by smoking.[2] The high prevalence of patients with URTIs in Brazil was due to the influenza A (H1N1) pandemic that occurred there during the study period.[10]

In terms of patients' characteristics, this present study found a male: female ratio of 1.4:1. Findings in other studies ranged from 1.2 to 3.5:1.[8,13,14]

Our results also show that more females were HIV-positive (13.8% vs. 7.9%). This may be attributed to the higher risk of women contracting the virus during unprotected sex when compared to their male counterparts.[15] It is interesting to note that 95 of the cases (10.4%), were HIV positive seen more among patients with tuberculosis. This represents one in every ten patients seen. Although it is not routine in our hospital to screen all patients presenting at the emergency department for HIV, this high level was recorded among those who had indications for screening. This underscores the need for universal precautions whenever patients are being attended to in the emergency department regardless of the cause of presentation.

The mean age of the male patients in this study was 48.5 ± 20.4 years while that of the females was 43.8 ± 18.9 years. From our study, this difference was statistically significant.

This study also revealed that 54.9% of the patients were aged 40 years and above. This is similar to the findings in Ido where 64.1% of the patients were 40 years and above. This may be attributable to comorbid medical conditions and possible increase susceptibility to illnesses including respiratory infections with increasing age.[16]

From this study, we observed that more patients were seen during the rainy season (April–October) – 59% than during the dry season (November–March) – 41%. This finding in this study, though not statistically significant, is similar to that of Sachdeva in India who reported more TB-related admissions in April–June (56.4%) in comparison to January–March (43.6%).[14]

Desalu in his study in 2011 also reported that asthma and pulmonary TB were higher in the wet season but found that

the number of patients with acute exacerbation of COPD and pneumonia were significantly higher in the dry season.[17] It is generally known that there is increase susceptibility to respiratory tract infections during the wet seasons particularly viral infections which could then increase the likelihood of a superimposed bacterial infection. It is, however, pertinent to note that in recent times, there have been changes in weather conditions which are possibly due to climate change engendered by the depleting ozone layer, this has made the previous clear – cut delineation between dry and wet seasons to be less distinct. In addition, presentation to the hospital in our environment is usually a function of the economic power of the patients, accessibility of the health facility and the general health-seeing behavior of the people.

The mortality within 24 h of presentation was found to be 7.1% from this study. This is similar to what was recorded by the study in Ido where the mortality within 24 h was found to be 7.4%.[13] Our result is higher than the findings in Brazil with a mortality of 2.7%.[11] This may be due to late presentation to the hospital by many of the patients in this part of the world and also to the availability of better healthcare facilities when compared to the latter.

Poor, missing, and incomplete documentations were some of the limitations we observed in carrying out this study. Due to inadequately equipped emergency department with diagnostic facilities, some rarer respiratory conditions might have been missed out. However, this audit is a good starting point in documenting the pattern of respiratory emergencies in our environment.

CONCLUSION

This study showed that respiratory diseases constitute a high burden in our environment. Of special note is the contribution by complicated tuberculosis, pneumonias, acute severe asthma, and acute exacerbation of COPD. It is hoped that this study will form a framework for larger studies in this regard. There is urgent need to adequately equip hospitals in Nigeria to handle common acute respiratory emergencies in other reduce morbidity and mortalities from these diseases.

Conflicts of interest
There are no conflicts of interest.

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